Volume 24 Numbers 1–6 January–December 2000

Journal of Medical Engineering & Technology

An international bimonthly journal promoting the application of engineering and technology in medical research and clinical medicine

Editor in Chief

Emeritus Professor M. M. Black
University of Sheffield
c/o 26 Broad Elms Lane
Sheffield S11 9RQ

North American Editor

Dr M.J. Thubrikar
(Associate Director)
Heineman Medical Research Laboratories
Carolinas Medical Center
1000 Blythe Blvd.
Charlotte, NC 28203, USA

Adjunct Professor of Biomedical Engineering
University of North Carolina, Charlotte, NC, USA

Associate Editors

Dr J. Fenner
Dr P. V. Lawford
(Selected Contents & Book Reviews)
Department of Medical Physics
& Clinical Engineering
University of Sheffield
Royal Hallamshire Hospital
Glossop Road
Sheffield S10 2JF

Editorial Committee

Professor J. Edwards
Rehabilitation Technology Unit
Regional Spinal Injuries Centre
Southport District General
Hospital
Southport PR8 6PN

Dr S. Meldrum
Department of Medical Physics &
Bioengineering
Norfolk & Norwich Hospital
Norwich NR1 3SR

Dr D. Tayler
225 Ringing Low Road
Sheffield S11 7PT

Dr S. W. Smye
Medical Physics Department
St James's University Hospital
Beckett Street
Leeds LS9 7TF

Dr W. Wain
Sorin Biomedica
Holmbush Estate
Midhurst
West Sussex GU29 9HX

Professor I. A. Sutherland
Brunel Institute for Bioengineering
Brunel University
Uxbridge
Middlesex UB8 3PH

Professor J. P. Woodcock
Department of Medical Physics &
Bioengineering
University Hospital of Wales
Heath Park, Cardiff CF4 4XW

Contents of Volume 24 (2000)

NUMBER 1 JANUARY–FEBRUARY 2000

Measurement and cardiology—increasing the usefulness of measurement in the future
D.C. Crossman 1

Good design practice for medical devices and equipment, Part I: a review of current literature
K. Alexander and P.J. Clarkson 5

Use of telekinesthetic feedback in walking assisted by functional electrical stimulation
I. Cikajlo and T. Bajd 14

A quantitative study of the pixel-shifting, blurring and nonlinear distortions in MRI images caused by the presence of metal implants
F.M. Bui, K. Bott and M.P. Mintchev 20

Reduction of electromagnetic interference from a commercially available MR-compatible flow simulator
M.B. Robertson, U. Köhler and I. Marshall 28

Review: Hospital bed mattresses: an overview of technical aspects
S. Rihalia and L. Kenney 32

Humidity measurements in passive heat and moisture exhangers applications: a critical issue
G. Dubini and R. Fumero 40

NUMBER 2 MARCH–APRIL 2000

The development of a computer controlled system to simulate in rats, the rapid, frequent changes in oxygen experienced by preterm infants developing retinopathy of prematurity
J. McColm and S. Cunningham 45

Good design practice for medical devices and equipment, Part II: design for validation
K. Alexander and P.J. Clarkson 53

Modelling transthoracic defibrillation waveforms
V. Krasteva, A. Cansell and I. Daskalov 63

Review: Expert systems in medicine: academic exercise or practical tool?
K.S. Metaxiotis and J.-E. Samouilidis 68

Time–frequency analysis of the heart rate variability during the Valsalva manoeuvre
G. Ramos, S. Carrasco and V. Medina 73

NUMBER 3 MAY–JUNE 2000

Comparison of cardiotropic drug effects on haemodynamic and myocardial energetics in patients with heart failure: a computer simulation
A.Y. Bekker, S. Wolk, J. Rim, H. Turndorf and A.B. Ritter 87

Different responses of Finapres and the oscillometric finger blood pressure monitor during intensive vasomotion
R. Raamat, K. Jagomägi and J. Talts 95

Computational haemodynamics analysis and comparison study of arterio-venous grafts
P.W. Longest and C. Kleinstreuer 102

A virtual instrument (VI) for haemodynamic management in ICU and during surgery
F. Clemente, M. Antonini, C. De Lazzari, G. Ferrari, R. Mimmo, M. Guaragno and G. Tosti 111

Q-Pro: a quality control management system for medical equipment
Z. Kolitsi, J. Bliznakov, K. Gueorguieva-Bliznakova, Y. Theodorakos and N. Pallikarakis 117

Platinum stimulating electrodes in physiological media
J. Rozman, I. Milošev and M. Jenko 123

New products 129

NUMBER 4 JULY–AUGUST 2000

Accurate 3D reconstruction of complex blood vessel geometries from intravascular ultrasound images: *in vitro* study
K.R. Subramanian, M.J. Thubrikar, B. Fowler, M.T. Mostafavi and M.W. Funk 131

Measurements of cardiac output of an isolated heart using a specially designed turbine
M. Bunc, D. Šuput, O. Zupanc and J. Rozman 141

Selection of the best element type in the finite element analysis of hip prostheses
R. Muccini, M. Baleani and M. Viceonti 145

A review of rapid prototyping (RP) techniques in the medical and biomedical sector
P.A. Webb 149

Portable and programmable clinical EOG diagnostic system
Shih-Chung Chen, Tzu-Tung Tsai and Ching-Hsing Luo 154

Computational modelling of blood flow through curved stenosed arteries
H. Yao, K.C. Ang, J.H. Yeo and E.K.W. Sim 163

Dynamic powerline interference subtraction from biosignals
I.I. Christov 169

Influence of sizing and subcoronary implantation technique on the function of porcine aortic homografts
M.J. Thubrikar, G.G. Gong, I.E. Konstantinov, G.A. Selim, B.L. Fowler and F. Robicsek 173

News & Product Update 181

NUMBER 5 SEPTEMBER – OCTOBER 2000

Development of an *ex vivo* model to investigate the effects of altered haemodynamics on human bypass grafts
J. Armstrong, A.J. Narracott, R. Milton, J. Galea, G.J. Cooper, P.V. Lawford, D.R. Hose, D.C. Cumberland and C.M. Holt 183

Effects of asymmetric branch flow rates on aerosol deposition in bifurcating airways
Z. Zhang, C. Kleinstreuer and C.S. Kim 192

Numerical study of unsteady stenosis flow: parametric evaluation of power-law model
E.Y.K. Ng, W.L. Siauw and W.E.W. Goh 203

Automatic adjustment of biphasic pulse duration in transthoracic defibrillation
V. Krasteva, I. Iliev, A. Cansell and I. Daskalov 210

Development and evaluation of a two-dimensional electrocutaneous cognitive feedback system for use in paraplegic standing
Z. Matjačić, P.L. Jensen, R.R. Riso, M. Voigt, T. Bajd and T. Sinkjaer 215

How to produce a pulsatile flow with low haemolysis?
K.W. Qian, P. Zeng, W.M. Ru, H.Y. Yuan, Z.G. Feng and I. Li 227

Rotational laxity after anterior cruciate ligament injury by kinematic evaluation of clinical tests
S. Zaffagnini, S. Martelli, B. Falcioni, M. Motta and M. Marcacci 230

NUMBER 6 NOVEMBER – DECEMBER 2000

Computerized densitometric measurement system (CDMS) for the quantitative analysis of diffuse retinal nerve fiber layer atrophy
J.S. Lee, D.M. Kim, K. Yi and K.S. Park 237

Handcycling: different modes and gear ratios
L.H.V. van der Woude, I. Bosmans, B. Bervoets and H.E.J. Veeger 242

A multi-purpose rehabilitation frame: an apparatus for experimental investigations of human balance and postural control
Z. Matjačić 250

Mesh-independent prediction of skin burns injury
E.Y.K. Ng and L.T. Chua 255

Application of orthogonal neural network to craniomaxillary reconstruction
J.-H. Hsu and C.-S. Tseng 262

Stress analysis of different wall thicknesses of implant fixture with various boundary levels
H.-M. Huang, L.-D. Wu, S.-Y. Lee, H.-C. Chen, J.-L. Chen and C.-T. Chen 267

Measurement of rotary pump flow and pressure by computation of driving motor power and speed
K.X. Qian, P. Zeng, W.M. Ru, H.Y. Yuan, Z.G. Feng and L. Li 273

Skin tensile strength modulation by compressive garments in burn patients. A pilot study
R. Fournier and G.E. Piérard 277

News & Product Update 281